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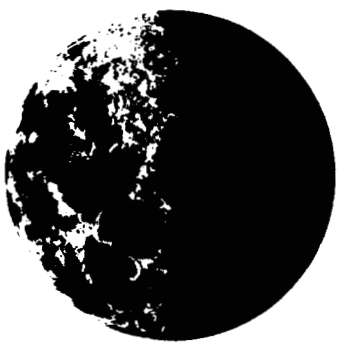
BOILERPLATE NO. 9 SPACECRAFT DYNAMICS SIMULATION GROUND TEST SPECIFICATION PROJECT APOLLO SPACECRAFT

(Unclassified)

NAS 9-150

28 February 1962



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CLASSIFICATION CHANGE

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NAS 9-150

28 February 1962

Approved by

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NORTH AMERICAN AVIATION, INC.
SPACE and INFORMATION SYSTEMS DIVISION

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CONFIDENTIAL

CONTENTS

CONFIDENTIAL

APPENDICES

ILLUSTRATIONS

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1. SCOPE

1.1 Scope. - This specification covers the requirements for a Spacecraft Dynamics Simulation Ground Test Boilerplate. The boilerplate shall be used to test the dynamic structural compatibility with a simulated launch vehicle.

2. APPLICABLE DOCUMENTS

2.1 General. - The following documents shall form a part of this specification:

Government Documents

Air Force

ARDCM-80-1, Volume 1	Handbook of Instructions for Aircraft Designers

National Aeronautics and Space Administration

NCP200-2	Quality Assurance Provisions for Space Contractors, dated 15 December 1961.

Non-Government Documents

Space and Information Systems Division, North American Aviation, Inc.

SID 62-240	Preparation for Delivery of Airborne Equipment, General Requirements For

3. REQUIREMENTS

3.1 General. - The configuration of the boilerplate shall be similar to the configuration for the Apollo Spacecraft. The configuration of the boilerplate is shown in figure 1.

3.2 Components. -

3.2.1 Arrangement. - The boilerplate shall simulate the dynamic (vibrational) characteristics of the Apollo Spacecraft. The boilerplate shall include:

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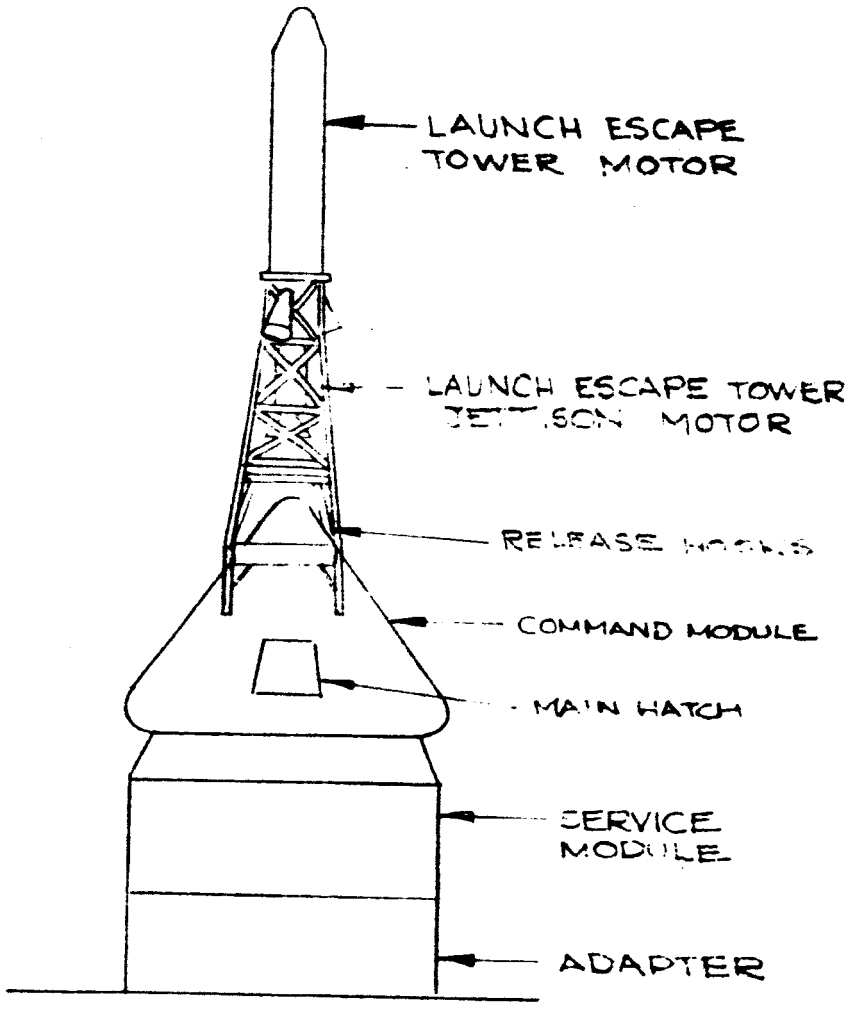

Figure 1. Boilerplate #9

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(a) Command Module

(b) Service Module

(c) Spacecraft Adapter

(d) Launch Escape Tower

3.2.1.1 Command Module. - The command module of the boilerplate shall be an approximate prototype structure of the command module of the Apollo Spacecraft.

3.2.1.2 Service Module. - The service module of the boilerplate shall be an approximate prototype structure of the service module of the Apollo Spacecraft.

3.2.1.3 Spacecraft Adapter. - The spacecraft adapter of the boilerplate shall be an approximate prototype structure of the finalized Spacecraft Adapter of the Apollo Spacecraft.

3.2.1.4 Launch Escape Tower. - A prototype launch escape tower shall be used on the boilerplate. The launch escape tower motors shall be simulated on the prototype launch escape tower.

3.2.2 Equipment. - The equipment for the boilerplate shall include the equipment listed in Appendix I-A.

3.3 Performance. -

3.3.1 General. - The complete boilerplate shall be joined in a manner similar to the prototype spacecraft. The boilerplate shall be mounted on a simulated launch vehicle and shall be used for dynamic testing. The installation and procurement of instrumentation shall be the responsibility of the Procuring Agency.

3.4 Design and Construction. -

3.4.1 General. - There shall be no functional equipment on the boilerplate. Materials that will insure structural soundness shall be used. Actual stiffness shall be simulated. ARDCM -80-1, Volume 1, shall be used for guidance and reference material in the design and construction of the boilerplate.

3.4.2 Weight. - The boilerplate shall have a mass and center of gravity similar to the mass and center of gravity of the prototype Apollo Spacecraft.

3.5 Ground Support Equipment. -

3.5.1 General. - Ground support equipment shall be required to transport, demonstrate and test the boilerplate. The requirements for ground support equipment are not a part of this specification.

4. QUALITY ASSURANCE PROVISIONS

4.1 General. - Quality assurance provisions for the boilerplate shall be in accordance with the applicable portions of NASA Bulletin NC P200-2

4.2 Inspection and Tests. - Inspections and tests to determine conformance of the boilerplate to contract and specification requirements shall be conducted prior to submission of the boilerplate to NASA or in the pres-presence of a NASA representative. Results of inspection tests on major components shall be submitted to NASA for review. Other acceptance test data relative to this specification shall be maintained and made available for review to NASA upon request.

5. PREPARATION FOR DELIVERY

5.1 Airborne Equipment. - Airborne equipment shall be prepared for delivery in accordance with Specification SID 62-240.

5.2 Transportation. - Provisions shall be included for transportation of the boilerplate to Marshall Spaceflight Center, Huntsville, Alabama.

6. NOTES

6.1 Definitions. - A boilerplate is a simulated spacecraft module for pre-developmental and/or developmental tests leading to the design of a prototype module.

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Appendix I-A

Contractor-Furnished Equipment, Contractor-Installed

Power Systems

Item No.	Quantity	Description	Part No.
1	1 set	Launch Escape Tower Motors (Simulated)	